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JAPANESE PATENT SPECIFICATION

No. 58-158145 (1983)

PROCESS FOR PRODUCTION OF PULVERULENT MALTOSE REDUCTION PRODUCTS

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PATENT CLAIM

A process for production of pulverulent maltose reduction products, comprising the steps of concentrating reduced maltose syrup, seeding and kneading the concentrate at a temperature of 50-140° with maltitol crystals and maltotriitol crystals with abundant precipitation of new crystals, and pulverizing the mass in accordance with established practice.

REFERENCE EXAMPLE 1

High purity maltitol syrup (100 g) was vacuum concentrated and the solid (80 g) transferred on to a tray which was introduced into a hot blast dryer operated at 125°. After 1 hour of drying the sugar

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was turned over with a spatula and allowed to stand for 1 hour. During this standing period the sugar alcohol turned white due to crystallization. On cooling, the mass became friable and was crushed in a mortar from which 75 g of pulverulent, crystalline maltitol (m.p. 148-150°) was recovered.

REFERENCE EXAMPLE 2

Ten grams of high purity maltotriitol (95%, balance 0.2% maltitol and 4.8% other) was dissolved in 20 ml of anhydrous pyridine and 50 ml methanol and 50 ml acetone added. Crystallization commenced after 30 minutes' quiescent standing at 60°. The mixture was then allowed to cool to room temperature. Two hours later, the precipitated crystals were recovered by filtration and dried. The anhydrous crystals (1.5 g) had a melting point of 179.2-179.5°, $[\alpha]_D$ +140°.

REFERENCE EXAMPLE 3

Fifty grams of the sugar alcohol composition of the preceding reference example was dissolved in water to 80% (w/w) solids concentration and the solution heated to 80°, 0.1 g of the crystals of the preceding reference example added, and the mixture agitated for 30 min at 80° and then allowed to stand overnight at room temperature. A precipitate of columnar crystals was collected by

centrifugation. The dry crystals weighed 20 g. The crystalline maltotriitol was only slightly hygroscopic, m.p. 183.3-187.4°, $[\alpha]_D$ +146.9°. The crystals were anhydrous.

EXAMPLE 1

A reduced maltose syrup (5% sorbitol, 75% maltitol, 15% maltotriitol, 5% other, in all 80% solids) (250 g) was vacuum concentrated to 87.5% solids and transferred to a tray. The concentrate was seeded with 0.1 g of pulverulent sorbitol crystals, 1.5 g of maltitol crystals obtained as in Reference Example 1 and 0.3 g of the maltotriitol crystals of Reference Example 3. After thorough kneading, the mixture was placed in a hot blast dryer operated at 60°. With progressive crystallization the mass whitened and became plastic. It was extruded through fine orifices. The extrudate, after cooling, was chopped up with a blade. The granular material obtained was dried and aged at 60°. The free-flowing powder weighed 180 g.

This pulverulent product remained stable through more than six months' storage when packed in a film pouch or in a polyethylene container or glass jar. Its storage properties were those of common table sugar.

EXAMPLE 2

Hundred grams of a reduced maltose syrup (0.2% sorbitol, 80% maltitol, 19.8% maltotriitol, in all 75% solids) was concentrated to 92% and seeded with 0.8 g maltitol crystals and 0.2 g maltotriitol crystals. After about 1 hour's kneading at 60° the concentrate was allowed to stand at this temperature, followed by cooling to room temperature. The crystalline mass was crushed in a mortar. The amount of reduced maltose product obtained in pulverulent form was 70 g. This crystalline product was superior to maltitol crystals alone as seed crystals.

EXAMPLE 3

A 60% solids syrup containing equal parts by weight of maltitol and maltotriitol was concentrated to 90% solids. The concentrate was introduced on a tray into a hot blast dryer operated at 60° and seeded with 0.6 g of a 1:1 mixture of maltitol and maltotriitol crystals. The seeded concentrate was kneaded with crystallization and solidification, crushed in a mortar and again dried. The amount recovered was 55 g. This pulverulent sugar alcohol remained free flowing in storage.

COMPARATIVE EXAMPLE

A syrup of the same composition as in Example 3 was seeded with 0.6 g of ground maltitol crystals (only).

Substantially no crystal growth occurred and solidification occurred with difficulty. The solid product was a glassy powder which was highly hygroscopic, becoming sticky within minutes and liquid after standing.

THE GRAPH

In the graph, storage time (days) has been plotted against weight gain due to moisture absorption from the atmosphere (y-axis) for (1) the product of Example 3, (2) the product of the comparative example and (3) a 1:1 mixture of crystalline maltitol and crystalline maltotriitol.

The relative humidity of the atmosphere in the above tests was 60%.

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Pulverised reduced maltose syrup prodn. - involves concn. of the syrup, addn. of maltitol and maltotriitol crystals and then pulverising
Patent Assignee: NIKKEN CHEM KK (NIKM)
Number of Countries: 001 Number of Patents: 002
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Abstract (Basic): JP 58158145 A

In the process, a reduced maltose syrup is concentrated, crystals or maltitol and maltotriitol are added into the concentrate as crystal-seed, and the formed crystal is made into a powder by a usual method.

Reduced maltose syrup is composed mainly of maltitol and also contains appreciable amts. of sorbitol, maltotriitol and dextrin alcohol. It has mild sweetness and is used in dietary food because its essential component, maltitol, is a low-calorie sugar. Reduced maltose syrup has formerly been difficult to turn into a powder, but the present method affords polverised (I).

The raw reduced maltose syrup contains more than 50 wt.% maltitol and more than 10 wt.% maltotriitol.

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